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| APPLICATION NO.                                 | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/710,175                                      | 06/23/2004  | Han-Chang Kang       | REAP0025USA         | 4174             |
| 27765   | 7590        | 04/11/2006           | EXAMINER            |                  |
| NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION |             |                      | NGUYEN, LINH M      |                  |
| P.O. BOX 506                                    |             |                      | ART UNIT            | PAPER NUMBER     |
| MERRIFIELD, VA 22116                            |             |                      | 2816                |                  |

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/710,175 | <b>Applicant(s)</b><br>KANG ET AL. |  |
|                              | <b>Examiner</b><br>Linh M. Nguyen    | <b>Art Unit</b><br>2816            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-36 is/are allowed.
- 6) ☒ Claim(s) 14, 17, 20, 21, 25, 28 and 29 is/are rejected.
- 7) ☒ Claim(s) 18, 19, 22-24, 26, 27 and 30-32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Claims 14-36 are presented in the instant application according to the Applicants' filing on 03/16/2006.

#### ***RCE acknowledgement/ Prosecution reopened***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after a final office action or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 03/16/2006 has been entered.

#### ***Inventorship***

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

#### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations, in claim 14, "*a second buffer..., a second DAC..., a second variable capacitor ...*"; the limitation in claims 25, 35 and

Art Unit: 2816

36, "*a second output signal..., a second digital value..., a second variable capacitor ...*"; and the limitations, in claims 33 and 34, "*a second adjusting circuit ..., a second DAC..., a second variable capacitor ...*"; must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 14-17, 20-21, 25 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kameya (U.S. Patent No. 4,829,272).

With respect to claims 14 and 25, Kameya discloses, in Fig. 1, an apparatus and its corresponding method for adjusting a phase difference, the apparatus comprising a first buffer [I] for buffering a first input signal and outputting a first output signal [3]; a first DAC for outputting a control voltage [Vd] corresponding to a first digital value representative of a phase delay, and a first variable capacitor [Dv] coupled to the first DAC and the first buffer, the capacitance value of the first variable capacitor corresponding to the first control voltage, wherein by controlling the first digital value, the phase difference of the first input signal is adjusted.

Kameya fails to disclose a second buffer for buffering a second input signal and outputting a second output signal; a second DAC for outputting a second control voltage corresponding to a second digital value representative of a phase delay; and a second variable capacitor coupled to the second DAC and the second buffer, the capacitor value of the second variable capacitor corresponding to the second control voltage.

However, as admitted by the Applicant and clearly stated in the Arguments/Remarks filed on 02/08/2006, at page 6, lines 18-24, that *"It should be obvious to one skilled in the art that a second line of elements can be added directly below the circuit detailed in Fig.2, wherein a first input signal is input to the first buffer, and a second input signal is input to the second buffer. Both circuits respectively operate to generate a phase difference of a first input signal and to generate a phase difference of a second input signal. In this case, the phases of each input signal will be adjusted, thereby adjusting the phase difference between the two input signals"*.

Art Unit: 2816

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure Kameya circuit with a second buffer, a second DAC and a second variable as claimed for phase adjustment as clearly admitted by the Applicants.

With respect to claims 15-17, "*the recitations the apparatus being implemented in a receiver*" or "*the recitations the apparatus being implemented in a transmitter*" do not further limit the limitation of previous claim 14. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987). Therefore, these limitations have not been given patentable weight.

With respect to claims 20-21 and 28-29, Kameya discloses that the input signal(s) are clock/RF signals.

***Allowable Subject Matter***

6. Claims 33-36 are allowed.
7. Claims 18-19, 22-24, 26, 27 and 30-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter:  
  
The closest prior art of record does not show or fairly suggest:  
  
a) An apparatus, in which the first input and the second input are differential signals, as called for in claims 18 and 26;

b) An apparatus, in which the first input signal and the second input signal are an in-phase signal and a quadrature-phase signal respectively, as called for in claims 19 and 27;

c) An apparatus, in which the first variable capacitor and the second variable capacitor are voltage-controlled capacitors, as called for in claims 22 and 30;

d) An apparatus, in which by controlling at least one of a first and a second adjusting circuits, the phase difference between the *in-phase* signal and the *quadrature-phase* signal reaches a predetermined condition, in combination with the remaining limitations, as called for in claim 33;

e) An apparatus, in which by controlling at least one of a first and a second adjusting circuits, the phase difference between the *positive* signal and the *negative* signal reaches a predetermined condition, in combination with the remaining limitations, as called for in claim 34;

f) A method, in which the step of adjusting at least one of a first variable capacitor and a second variable capacitor by respectively utilizing a first control voltage generated from the first digital value and a second control voltage generated from the second digital value, to make the phase difference between the *in-phase* signal and the *quadrature-phase* signal reach a predetermined condition, in combination with the remaining limitations, as called for in claim 35; and

g) A method, in which the step of adjusting at least one of a first variable capacitor and a second variable capacitor by respectively utilizing a first control voltage generated from the first digital value and a second control voltage generated from the second digital value, to make the

Art Unit: 2816

phase difference between the *positive* signal and the *negative* signal reach a predetermined condition, in combination with the remaining limitations, as called for in claim 36.

***Remarks***

9. Applicants' arguments filed 11/25/2005 regarding claims 14-32, at pages 9-10, have been fully considered but they are not persuasive due to the Applicants' own admittance as indicated in the Arguments/Remarks filed on 02/08/2006, at page 6, lines 18-24 referencing obviousness as set forth in the office action's under 35 U.S.C. 103(a) rejections.

***Citation of Relevant Prior Art***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Prior art Higuchi et al. (U.S. Patent No. 6,637,008) discloses an apparatus (Fig. 38) for adjusting a phase difference, the apparatus including buffers, DACs and variable capacitors.

***Inquiry***

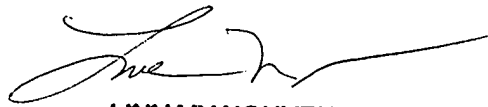
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linh M. Nguyen whose telephone number is (571) 272-1749. The examiner can normally be reached on Alternate Mon, Tuesday - Friday from 7:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on (571) 272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2816

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LMN



**LINH MY NGUYEN**  
**PRIMARY EXAMINER**